

CLAIMS

5 WHAT IS CLAIMED IS:

1. A heat exchanger comprising:
 - a first end tank;
 - a second end tank opposite the first end tank;
 - 10 a first tube in fluid communication with the first and second end tanks, the first tube adapted to have a first fluid flow therethrough, the first tube having a hydraulic diameter less than about 1.00 mm;
 - a second tube in fluid communication with the first and second end tanks, the second tubes adapted to have the first fluid flow therethrough after
 - 15 the first fluid flows through the first tube, the second tube having a hydraulic diameter less than about 1.00 mm;
 - at least one fin contacting the first tube and the second tube, with the first and second tubes and the fins being generally co-planar relative to each other;
 - 20 wherein the heat exchanger is a single pass or two-pass exchanger.
2. A heat exchanger as in claim 1 wherein the hydraulic diameter of the first tube or second tube is less than about 0.6 mm.
- 25 3. A heat exchanger as in claim 2 wherein the hydraulic diameter of the first tube or second tube is less than or equal to about 0.5 mm, and wherein the heat exchanger is a single pass exchanger.
- 30 4. A heat exchanger as in claim 1 wherein the first tube and second tube define a plurality of sub-passageways extending along a length of the first tube and second tube wherein each of the sub-passageways of the first tube and second tube have a cross-sectional area perpendicular to the

length of the first tube and second tube that is between about 0.02 mm² and about 1.00 mm².

- 5 5. A heat exchanger comprising:
 a first end tank;
 a second end tank opposite the first end tank;
 a plurality of first tubes in fluid communication with the first and second
 end tanks, the plurality of first tubes adapted to have a first fluid flow
10 therethrough, the plurality of first tubes each having a hydraulic diameter less
 than about 1.00 mm;
 a plurality of second tubes in fluid communication with the first and
 second end tanks, the plurality of second tubes adapted to have the first fluid
 flow therethrough after the first fluid flows through the plurality of first tubes,
15 the plurality of second tubes each having a hydraulic diameter less than about
 1.00 mm; .
 at least one fin contacting the one or the plurality of first tubes and at
 least one of the plurality of second tubes, with the first and second tubes and
 the fins being generally co-planar relative to each other; and
20 wherein the fin height is less than or equal to about 10.0mm.

6. A heat exchanger as in claim 5 wherein the hydraulic diameter
 of each first tube is less than about 0.6 mm, and the fin height is less than or
 equal to about 9.0mm.

- 25 7. A heat exchanger as in claim 6 wherein the hydraulic diameter
 of each second tube is less than or equal to about 0.5mm, and the fin height
 is less than or equal to 8.0mm .

- 30 8. A heat exchanger as in claim 5 wherein each first tube defines a
 plurality of sub-passageways extending along a length of each first tube
 wherein each of the sub-passageways of each first tube has a cross-sectional

area perpendicular to the length of each first tube that is between about 0.02 mm² and about 1.00 mm².

9. A heat exchanger as in claim 8 wherein each second tube
5 defines a plurality of sub-passageways extending along a length of each second tube wherein each of the sub-passageways of each second tube has a cross-sectional area perpendicular to the length of each second tube that is between about 0.02 mm² and about 1.00 mm².

10. A heat exchanger comprising:

a first end tank;

a second end tank opposite the first end tank;

a plurality of first tubes in fluid communication with the first and second
end tanks, the plurality of first tubes adapted to have a first fluid flow
15 therethrough, the plurality of first tubes having a hydraulic diameter less than or equal to about 0.40 mm and greater than or equal to about 0.15mm;

a plurality of second tubes in fluid communication with the first and
second end tanks, the plurality of second tubes adapted to have the first fluid
flow therethrough after the first fluid flows through the plurality of first tubes,
20 the plurality of second tubes each having a hydraulic diameter greater than or equal to about 0.15mm; and

a plurality of fins disposed between the pluralities of first and second
tubes, with the pluralities of first and second tubes and the plurality of fins
being generally co-planar relative to each other.

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11. A heat exchanger comprising:

a first end tank;

a second end tank opposite the first end tank;

a first tube in fluid communication with the first and second end
30 tanks, the first tube adapted to have a first fluid flow therethrough;

a second tube in fluid communication with the first and second end
tanks and the first tube wherein the second tube has a substantially identical

diameter as the first tube and wherein the second tube is adapted to have the first fluid flow therethrough after the first fluid flows through the first tube;

at least one fin contacting the first tube and the second tube, with the first and second tubes and the fins being generally co-planar relative to each other.

12. A heat exchanger comprising:

a first end tank;

a second end tank opposite the first end tank;

10 a plurality of first tubes in fluid communication with the first and second end tanks, the plurality of first tubes adapted to have a first fluid flow therethrough, the plurality of first tubes having a hydraulic diameter less than about 1.00 mm;

15 a plurality of second tubes in fluid communication with the first and second end tanks, the plurality of second tubes adapted to have the first fluid flow therethrough after the first fluid flows through the plurality of first tubes, the plurality of second tubes each having a hydraulic diameter less than about 1.00 mm;

20 a one or a plurality of third tubes in fluid communication with the first and second end tanks, the third tubes adapted to have a fluid flow therethrough; and

a plurality of fins disposed between the pluralities of first and second tubes and the plurality of fins being generally co-planar relative to each other.

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13. A heat exchanger as in claim 12, wherein the third tube or plurality of tubes are above or below the first and second plurality of tubes.

14. A heat exchanger as in claim 1, wherein a core depth of the
30 heat exchanger is between 6.0 and 27.00mm.